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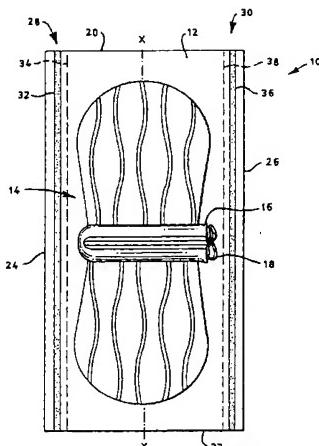
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FEMININE SANITARY PROTECTION DEVICE HAVING AN OUTER COVER WITH PERFORATED LINES AND METHOD FOR MAKING THE SAME

BACKGROUND OF THE INVENTION

The present invention relates to a feminine sanitary protection device that protects a user by absorbing and containing menstrual fluids and other body exudes as well as a method for making the same. More specifically, this invention relates to a feminine sanitary protection device which provides substantially complete sanitary protection, ease in handling, and discretion in packaging appearance as well as a method for making the same.

Absorbent articles are designed to absorb body fluids, including menses, and may come in different functional designs. In one design category, sanitary napkins are externally worn about the pudendal area and are designed primarily for heavy flow. In another category, panty liners or panty shields are thin products externally worn about the pudendal area and are designed for light flow. In yet another category, tampons are designed to be positioned internally within the vagina.

Sanitary napkins can have high absorptive capacity with either a thin or thick absorptive element. However, compressive forces of the wearer's thighs and pudendal region during any physical movement, such as walking, can cause the sanitary napkin to shift from an original position protecting the vulva area. After a relatively short period of time, the sanitary napkin may move away from the vaginal orifice. The wearer's movement, particularly vigorous movement such as rapid walking or running, also can cause discomfort such as by rubbing or chafing in the sensitive vulva area.

In addition to concerns of sanitary napkin movement and discomfort, a

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concern of high degree of wearing awareness is present. Some thick sanitary napkins have a high profile appearance when viewed through a wearer's outer garments. The sanitary napkins can be very apparent when worn with tight fitting clothing including slacks, body suits, swimming suits, or similarly thin or close fitting outer garments.

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Panty liners or panty shields have been developed for light or low menstrual flows. Some panty liners or panty shields have the same concerns associated with sanitary napkins, although their thin profile makes them more flexible, less noticeable in appearance, and generally more comfortable than the bulky sanitary napkins. However, the thin profile panty liners or panty shields can have a drawback in the performance area of absorptive capacity.

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Tampons are worn internally within the vaginal canal to intercept body fluid. Sometimes tampons may not function completely to prevent leakage because radial expansion of the tampon within the vaginal canal does not form a perfect seal. Yet without such radial expansion and swelling of the tampon within the vaginal canal, the tampon does not serve as a completely reliable sanitary protection device.

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In an attempt to address the above stated problems, a sanitary napkin or a panty liner is rolled about a tampon or similar device, and then inserted into a pouch. However, additional problems arise associated with a napkin or panty liner rolled about a tampon or other similar device. One of these problems is that the napkin or panty liner can tend to curl after removal from the pouch, thereby making it more difficult, if not impossible, to adhere the curled napkin or panty liner onto an undergarment.

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Another problem associated with a rolled napkin or panty liner is the loss of comfort and absorbency due to the undesired shape of a curled or partially curled

napkin or panty liner.

Still another problem associated with a rolled napkin or panty liner is the potential loss of the embossing pattern on the cover, or the loss of some other cover characteristic.

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SUMMARY OF THE INVENTION

In response to the discussed difficulties and problems encountered in the prior art, a feminine sanitary protection device as well as a method for making such a device has been discovered.

10 In one form of the present invention there is provided a feminine sanitary protection device comprising an outer cover having a central longitudinal axis and including a top edge, a bottom edge, a pair of side edges, a first side portion between one of the side edges and the central longitudinal axis, and a second side portion between the other of the side edges and the central longitudinal axis. A
15 panty shield is placed on the outer cover between the first side portion and the second side portion. A first frangible line is in the first side portion, and a second frangible line is in the second side portion. The outer cover and the panty shield are tri-folded.

20 In another form of the present invention there is provided a feminine sanitary protection device comprising an outer cover having a central longitudinal axis and including a top edge, a bottom edge, a pair of side edges, a first side portion between one of the side edges and the central longitudinal axis, and a second side portion between the other of the side edges and the central longitudinal axis. A panty shield is placed on the outer cover, and the outer cover and the panty shield are folded together. There is a mechanism in the first side portion and in the second side portion for removing at least a portion of the first
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side portion and at least a portion of the second side portion from the outer cover.

In yet another aspect of the present invention there is provided a method for making a feminine sanitary protection device comprising the steps of (a) providing a continuously moving layer of material including a pair of side edges and a pair of side portions, (b) forming a frangible line in each of the side portions, (c) applying a joining element in each of the side portions, (d) placing a plurality of panty shields at spaced apart intervals on the continuously moving layer of material, (e) forming a plurality of individual panty shields and respective individual portions of the layer of material, and (f) folding each individual portion of the layer of material and its panty shield together.

In still another aspect of the present invention there is provided a method of making a feminine sanitary protection device comprising the steps of (a) providing a continuously moving layer of material including a pair of side edges and a pair of side portions, (b) forming a frangible line in each of the side portions, (c) placing a plurality of panty shields at spaced apart intervals on the continuously moving layer of material, (d) forming a plurality of individual panty shields and respective individual portions of the layer of material, and (e) folding each individual portion of the layer of material and its panty shield together.

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BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features of the present invention and the manner of attaining them will become more apparent, and the invention itself will be better understood by reference to the following description of the invention, 25 taken in conjunction with the accompanying drawings wherein:

Figure 1 illustrates an elevational view of a feminine sanitary protection

device,

Figure 2 illustrates an exploded perspective of the device of Figure 1,

Figure 3 illustrates a perspective view of the device of Figure 1 in a partially tri-folded form,

5 Figure 4 illustrates a perspective view of a pouch containing the fully tri-folded device of Figure 3,

Figure 5 illustrates an elevational view of a panty shield with a vaginal insertion device different from Figure 1,

10 Figure 6 illustrates an elevational view of a panty shield with a vaginal insertion device different from Figure 5, and

Figure 7 illustrates one method of making a feminine sanitary protection device.

DETAILED DESCRIPTION

15 The feminine sanitary protection device of the present invention provides a panty liner or panty shield folded over one or more vaginal insertion devices containing absorbents or medical devices for easy handling, use, and proper disposal. The term "folded" refers, by way of example only, to a C-fold or to a tri-fold as illustrated in Figure 3. The term "folded over" or variations thereof means the liner or shield has, for example, the tampon positioned within the folds. The term "vaginal insertion device" refers to a vaginal insert or vaginal insert applicator. By "vaginal insert", it is meant, by way of example only, a tampon or vaginal medicinal insert such as a vaginal suppository. By "vaginal insert applicator", it is meant, by way of example only, a tampon applicator or a vaginal medicinal insert applicator such as a vaginal suppository applicator.

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The device of the present invention provides a more discreet, convenient,

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and portable option than carrying a panty shield and a vaginal insertion device separately. A pouch, made with biodegradable and/or non-biodegradable materials, serves to protect the panty shield and vaginal insertion device prior to wear, and acts as a packaging agent. The present invention further provides efficiencies in material and manufacturing costs, and ease in consumer handling.

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One advantage of the present invention is that it conveniently contains the products a woman needs to feel fresh and completely protected from stains on her undergarments or adjacent clothing. The present invention also provides a woman with an almost zero chance of experiencing staining on her undergarments when using these products or devices together.

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Another advantage of the present invention is that it is more discreet and convenient than carrying two or more separate products. Thus, a woman does not need to go out and buy two or more separate products, thereby saving money and time. Nor does she need to carry them around separately, and make sure when it comes time to use them that all of the separate products still are available. The pouch keeps them fresh and protected from contamination. The pouch also provides a means for properly disposing of the panty liner or panty shield and vaginal insertion device.

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Referring now to the drawings, common elements in all of the drawings are referenced using the same identifying numerals.

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Referring now to Figures 1 - 3, a feminine sanitary protection device 10 of the present invention includes an outer cover 12, a panty shield 14, and a vaginal insertion device, such as a tampon 16 including a withdrawal string 18. The panty shield 14 represents a sanitary napkin, a panty liner, or any other similar article designed to be worn by a woman. Panty shield 14, as illustrated in Figure 1, has an hour glass shape, but it is understood that it can have any other suitable shape

such as an oval, straight-sided, racetrack, or the like. A central longitudinal axis X-X can represent both the longitudinal centerline for outer cover 12 and panty shield 14. Tampon 16 is illustrated as being placed on panty shield 14 in an orientation generally perpendicular to that of central longitudinal axis X-X.

Outer cover 12 includes a top edge 20, a bottom edge 22, and a pair of side edges 24, 26 extending between edges 20, 22. The shape of outer cover 12 is generally rectangular, but can have any other desired shape, such as an oval shape, racetrack shape, or the like. For ease of manufacturing, outer cover 12 is generally rectangular in shape. Outer cover 12 further includes a first side section 28 extending between top edge 20 and bottom edge 22, and from side edge 24 to central longitudinal axis X-X. Similarly, a second side section 30 extends between top edge 20 and bottom edge 22, and from side edge 26 to central longitudinal axis X-X. Within first side section 28 are a first joining element 32 and a first frangible line 34. First frangible line 34 is located between first joining element 32 and central longitudinal axis X-X. Similarly, second side section 30 includes a second joining element 36 and a second frangible line 38. Second frangible line 38 is between second joining element 36 and central longitudinal axis X-X. For purposes of economy, since first side section 28 with first joining element 32 and first frangible line 34 is identical to second side section 30 with second joining element 36 and second frangible line 38, only a description of first side section 28, first joining element 32, and first frangible line 34 will be made. It is understood then that this same description would apply to second side section 30, second joining element 36, and second frangible line 38.

First frangible line 34 provides a means or mechanism for removing at least a portion of first side section 28 from outer cover 12. The specific purpose for this means or mechanism for removing a portion of outer cover 12 will be explained

hereafter. Thus, the purpose of first frangible line 34 is to allow that portion of outer cover 12 between first frangible line 34 and side edge 24 to be removed or torn along first frangible line 34. Frangible line 34 may, for example, be provided by partially cutting or otherwise thinning through the layer of material of which outer cover 12 is made, may be provided by a selected pattern of perforations, 5 may be provided by a desired pattern of stress-fatigue weakening of outer cover 12, or the like. As illustrated, frangible line 34 is provided by a line of perforations in which there can be approximately 2-10 perforations per lineal inch.

First joining element 32 can be any suitable means or mechanism for joining respective portions of outer cover 12 together, as will be explained in greater detail hereafter. For example, first joining element 32 can be an adhesive applied along first side section 28, a thermal bondline, an ultrasonic bondline, or any other suitable means or mechanism for joining outer cover 12 together. If desired, for purposes of economy and manufacturing efficiency, first joining element 32 can be eliminated, and the means or mechanism for joining portions of outer cover 12 together can be provided by first frangible line 34. If first frangible line 34 is used in place of first joining element 32, it will serve both purposes of providing a joining of portions of outer cover 12 together, and providing for the removal of at least a portion of side section 28.

Referring now to Figure 2, feminine sanitary protection device 10 of Figure 20 1 is illustrated in an exploded, perspective view. Panty shield 14 generally comprises a liquid permeable cover 40, an absorbent medium 42, a liquid impermeable baffle 44, and a release strip 46 that is removably adhered to baffle 44 by release strip adhesive 48. Tampon 16, representing one type of vaginal insertion device, is also illustrated as being placed on cover 40 of panty shield 14. 25 However, it should be understood that panty shield 14 can be reversed, such that

tampon 16 would then be placed over release strip 46 and baffle 44. If desired, release strip 46 can be eliminated, and outer cover 12 can then serve the same purpose as release strip 46, which is to protect release strip adhesive 48 from contamination prior to attaching panty shield 14 to the user's undergarment.

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Referring now to Figure 5, panty shield 14 is illustrated with a different vaginal insertion device, namely a tampon applicator tube 50 containing a tampon, only the withdrawal string 18 being illustrated, and a plunger 52. Both the tampon applicator tube 50 and plunger 52 are placed on panty shield 14 and oriented to central longitudinal axis in the same manner as tampon 16 in Figure 1.

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Referring to Figure 6, another type of vaginal insertion device is illustrated in the form of a vaginal suppository 54 placed on panty shield 14 in a manner similar to that of tampon 16 in Figure 1.

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The intent of Figures 5 and 6 is to illustrate that various types of vaginal insertion devices can be associated with panty shield 14 and outer cover 12, so as to form a feminine sanitary protection device of the present invention.

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Turning now primarily to Figures 3 and 4, the feminine sanitary protection device 10 of Figure 1 is illustrated in a partially tri-folded manner. Although a tri-fold is desired, other folds are contemplated by the present invention, such as a C-fold. Outer cover 12 and panty shield 14 are folded together along fold lines 56, 58, thereby forming fold panel 60, fold panel 62, and base panel 64. As the tri-folding step or process continues, first joining element 32 joins portions of outer cover 12 together. Specifically, as fold panel 60 is fully folded downwardly, as viewed in Figure 3, and fold panel 62 is fully folded downwardly, outer cover portion 66 of fold panel 60 is adhered to outer cover portion 70 of base panel 64, and outer cover portion 68 of fold panel 62 is adhered to outer cover portion 66 of fold panel 60. In a similar manner, second joining element 36 joins second side

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section 30, thereby producing the feminine sanitary protection device 10 with pouch 13 illustrated in Figure 4. In this final folded form illustrated in Figure 4, first frangible line 34 is in generally overlapping alignment with itself, as illustrated in Figure 4. In a similar manner, second frangible line 38 is also in generally overlapping alignment with itself.

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In use, a user takes feminine sanitary protection device 10, illustrated in Figure 4, grasps, for example, first side section 28, and separates or tears a portion of it from outer cover 12 along frangible line 34. Similarly, a portion of second side section 38 would then be removed from outer cover 12 along second frangible line 38. Since both joining elements 32, 36 (Fig. 1) are between their respective outer cover side edges 24, 26 and central longitudinal axis X-X, when side sections 28, 30 are removed, so are joining elements 32, 36, thereby permitting the outer cover 12 and panty shield 14 to be unfolded. Panty shield 14 is then removed and, if used, release strip 46 is removed from baffle 44, so that panty shield 14 can be adhered to the undergarment.

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Due to the tri-folded shape of panty shield 14, several advantages are created. One of these is the elimination of the curling tendency associated with those prior art napkins or panty shields that are rolled about a tampon or other similar device. Upon removing tri-folded panty shield 14, it can be easily smoothed-out along fold lines 56, 58, thereby reassuming its desired shape or form, and allowing the panty shield to be easily adhered to an undergarment.

Another advantage with the present invention is that the tri-folded panty shield 14 does not diminish the comfort or absorbency in the Z-direction, which is associated with those earlier attempts with a rolled napkin or panty liner.

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Still another advantage with the present invention is that the tri-folded panty shield 14 will not lose its embossing or other surface characteristics, which can

occur with those earlier attempts utilizing a rolled napkin or panty liner.

Outer cover 12 can be made of any suitable material, and is desirably composed of a plastic material such as polyethylene or polypropylene. However, it may be composed of other materials such as polyethylene oxide (PEO), polyvinyl alcohol (PVOH), polycaprolactone (PCL), paper, or a nonwoven material such as a spunbond/meltblown material. Outer cover 12, as illustrated in Figure 1, is larger in size than panty shield 14. In a rectangular shape, outer cover 12 can have dimensions in the range, by way of example only, of about 10-25 centimeters (cm) in length and about 6-11 cm in width. This compares to a panty shield 14 generally having dimensions of about 16 cm in length and about 5.5 cm in width. Since the dimensions of a panty shield 14 can vary, outer cover 12 desirably has dimensions in the range of about 1-5 cm greater in length and in width than panty shield 14. The purpose of the larger size of outer cover 12 is to provide the additional material for the tri-folding and joining of outer cover 12 illustrated in Figures 3 and 4, without undesirably affecting panty shield 14 and the vaginal insertion device.

One construction and material composition of a panty shield 14 is the absorbent pad described in U.S. 4,372,312, which issued February 8, 1983; the contents of which are incorporated by reference herein. Another example of a panty shield is the absorbent pad described in U.S. 3,881,490, which issued on May 6, 1975, the contents of which are incorporated by reference herein. One example of the construction and material composition of a tampon is the tampon described in U.S. 5,807,372, which issued September 15, 1998; the contents of which are incorporated by reference herein.

Referring now to Figure 7, there is illustrated one exemplary method of making a feminine sanitary protection device in accordance with the principles of

the present invention. As illustrated, a layer of material 72 continuously moves in a generally left-to-right direction as viewed in Figure 7, and includes a side edge 74 and a side section 76 adjacent thereto, and a side edge 78 and a side section 80 adjacent thereto. The continuously moving layer of material 72 passes between a perforation roll 82 and an anvil roll 84 in order to provide a frangible line 86 in side section 76 and a frangible line 88 in side section 80. A pair of adhesive applicators 90, 92 apply an adhesive to continuously moving layer 72. Specifically, adhesive applicator 90 applies a joining element 94 between frangible line 86 and side edge 74, and adhesive applicator 92 applies joining element 96 between frangible line 88 and side edge 78. As layer 72 continues to move, it passes an adhesive applicator 98 that applies an adhesive, desirably intermittently, along or near the centerline of layer 72, and a panty shield placement station 100 places a plurality of panty shields 14 at spaced apart intervals upon individual ones of the adhesive patterns 102 applied by adhesive applicator 98.

After placement station 100, a vaginal insertion device placement station 104 intermittently and selectively places a vaginal insertion device 16 on each panty shield 14. Thereafter, a die-cutting roll 106 forms a plurality of individual panty shields 14 and respective individual portions 108 of layer 72. Thereafter, a folding station 110 tri-folds each individual panty shield 14 and its respective portion 108 into a feminine sanitary protection device 10 with pouch 13, as illustrated in both Figures 4 and 7.

According to the present invention, the above-described process can be modified in various ways. For example, the folding station 110 can include, in addition to a folding function, a pressing function in order to firmly adhere first side section 28 (Fig. 3) and second side section 30 of outer cover 12 firmly together. Further, folding station 110 can also include the function of the die-cutting roll 106.

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Such various types of apparatus are well known in the art in order to perform these cutting, folding, pressing, and other functions. Similarly, the perforation roll 82 and anvil roll 84 can be any suitable rolls or apparatus well known in the art in order to provide a line of selected perforations. The adhesive applicators 90, 92, 98 can be any suitable adhesive applicators well known in the art, and adhesive applicators 90, 92 can apply adhesive in either a continuous or intermittent manner.

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In another modification of the process illustrated in Figure 7, the perforation roll 82 and anvil roll 84 can be a part of folding station 110 so that the forming of a frangible line can be accomplished after each individual panty shield 14 and its respective portion 108 of layer 72 is folded. In other words, portion 108 would not have any frangible lines 86, 88 prior to folding station 110, and after a portion 108 and its respective panty shield 14 are tri-folded, then folding station 110, or another suitable apparatus, can provide or form the frangible lines along the side sections of the tri-folded device. In this particular modification, the adhesive applicators 90, 92 may also be eliminated, and their joining function can be accomplished by means of the frangible lines 86, 88, in this example a plurality of perforations.

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In the above description of one aspect of the present invention, each panty shield 14 includes a separate release strip 46 (Figure 2) for protecting the release strip adhesive 48, which in turn is used to secure the panty shield 14 in an undergarment. Another modification eliminates the release strip 46 in Figure 2 and substitutes therefor outer cover 12. Each panty shield 14 placed by placement station 100 then does not have a conventional release strip 46 (Fig. 2) and each portion 108 of layer 72 then provides the function of a release strip 46. The user opens the outer cover 12 and, upon separating it from panty shield 14, exposes release strip adhesive 48 (Figure 2) for attaching the panty shield 14 to

an undergarment. Again, other similar modifications can be accomplished, including rearranging the sequence of steps or events in the method illustrated in Figure 7.

While this invention has been described as having a preferred embodiment, it will be understood that it is capable of further modifications. It is therefore intended to cover any variations, equivalents, uses, or adaptations of the invention following the general principles thereof, and including such departures from the present disclosure as come or may come within known or customary practice in the art to which this invention pertains and falls within the limits of the appended claims.

What is claimed is:

1. A feminine sanitary protection device, comprising:

an outer cover having a central longitudinal axis, and including a top edge, a bottom edge, a pair of side edges, a first side section between one of said side edges and the central longitudinal axis, and a second side section between the other of said side edges and the central longitudinal axis,

a panty shield placed on said outer cover between said first side section and said second side section, and

a first frangible line in said first side section, and a second frangible line in said second side section,

10 said outer cover and said panty shield being tri-folded.

2. The device of claim 1 further comprising a first joining element in said first side section, and a second joining element in said second side section.

3. The device of claim 2 wherein said first joining element and said second joining element join respective portions of said tri-folded outer cover together.

4. The device of claim 1 wherein each said frangible line is in generally overlapping alignment with itself.

5. The device of claim 2 wherein said first frangible line is between said first joining element and the central longitudinal axis, and said second frangible line is between said second joining element and the central longitudinal axis.

6. The device of claim 1 further comprising a release strip for said panty shield.

7. The device of claim 6 wherein said outer cover is said release strip.
8. The device of claim 6 wherein said release strip is separate from said outer cover.
9. The device of claim 5 further comprising a vaginal insertion device placed with said panty shield.
10. A feminine sanitary protection device, comprising:
 - an outer cover having a central longitudinal axis, and including a top edge, a bottom edge, a pair of side edges, a first side section between one of said side edges and the central longitudinal axis, and a second side section between the other of said side edges and the central longitudinal axis,
 - 5 a panty shield on said outer cover, said outer cover and said panty shield being folded together, and
 - means in said first side section and in said second side section for removing at least a portion of said first side section and at least a portion of said second side section
 - 10 from said outer cover.
 11. The device of claim 10 further comprising means in said first side section and in said second side section for joining respective portions of said folded outer cover together.
 12. The device of claim 10 wherein said outer cover and said panty shield are tri-folded together.
 13. The device of claim 11 wherein said removing means is between said joining means.

14. The device of claim 10 further comprising a release strip for said panty shield.
15. The device of claim 14 wherein said outer cover is said release strip.
16. The device of claim 14 wherein said release strip is separate from said outer cover.
17. The device of claim 10 wherein said removing means includes a first frangible line in said first side section, and a second frangible line in said second side section.
18. The device of claim 17 wherein each said frangible line includes perforations in said outer cover.
19. The device of claim 10 further comprising a vaginal insertion device placed with said panty shield.
20. A method of making a feminine sanitary protection device, comprising the steps of:
 - providing a continuously moving layer of material including a pair of side edges and a pair of side sections,
 - 5 forming a frangible line in each of the side sections of the layer of material,
 - applying a joining element in each of the side sections of the layer of material,
 - placing a plurality of panty shields at spaced apart intervals on the continuously moving layer of material,
 - 10 forming a plurality of individual panty shields and respective individual portions of the layer of material, and
 - folding each individual portion of the layer of material and its panty shield together.

21. The method of claim 20 further comprising the step of placing a vaginal insertion device on each panty shield.
22. The method of claim 20 wherein each frangible line is formed between the joining element of its respective side section and a central longitudinal axis of the layer of material.
23. The method of claim 20 wherein each joining element is applied continuously.
24. The method of claim 20 wherein each joining element is applied intermittently.
25. The method of claim 20 further comprising the step of intermittently applying adhesive to the continuously moving layer of material, and
wherein the step of placing a plurality of panty shields includes placing the panty shields on the intermittently applied adhesive.
26. The method of claim 20 wherein the step of forming a plurality of individual panty shields and respective individual portions of the layer of material includes cutting the layer of material between the panty shields.
27. The method of claim 20 wherein the step of folding includes tri-folding each individual portion and its panty shield.
28. A method of making a feminine sanitary protection device, comprising the steps of:
providing a continuously moving layer of material including a pair of side edges and a pair of side sections,

- 5 forming a frangible line in each of the side sections,
placing a plurality of panty shields at spaced apart intervals on the continuously
moving layer of material,
forming a plurality of individual panty shields and respective individual portions of the
layer of material, and
10 folding each individual portion of the layer of material and its panty shield together.

29. The method of claim 28 further comprising the step of applying a joining element in
each of the side sections of the layer of material.

- 5 30. The method of claim 28 further comprising the step of placing a vaginal insertion
device on each panty shield.

31. The method of claim 29 wherein each frangible line is formed between the joining
element of its respective side section and a central longitudinal axis of the layer of
10 material.

32. The method of claim 28 wherein each joining element is applied continuously.

33. The method of claim 28 wherein each joining element is applied intermittently.

- 15 34. The method of claim 28 further comprising the step of intermittently applying
adhesive to the continuously moving layer of material, and
wherein the step of placing a plurality of panty shields includes placing the panty
shields on the intermittently applied adhesive.

35. The method of claim 28 wherein the step of forming a plurality of individual panty shields and respective individual portions of the layer of material includes cutting the layer of material between the panty shields.

25 36. The method of claim 28 wherein the step of folding includes tri-folding each individual portion and its panty shield.

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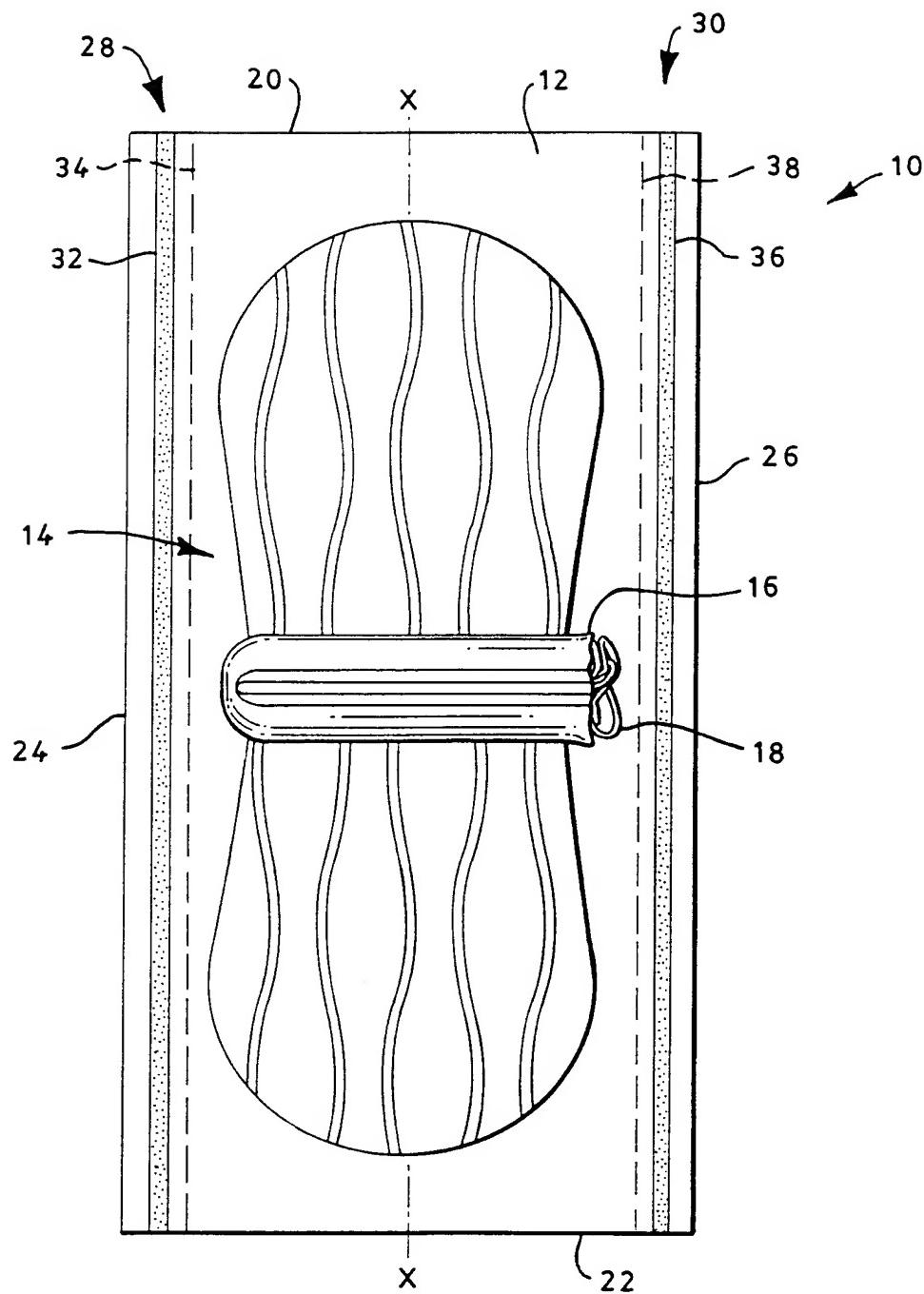


FIG. 1

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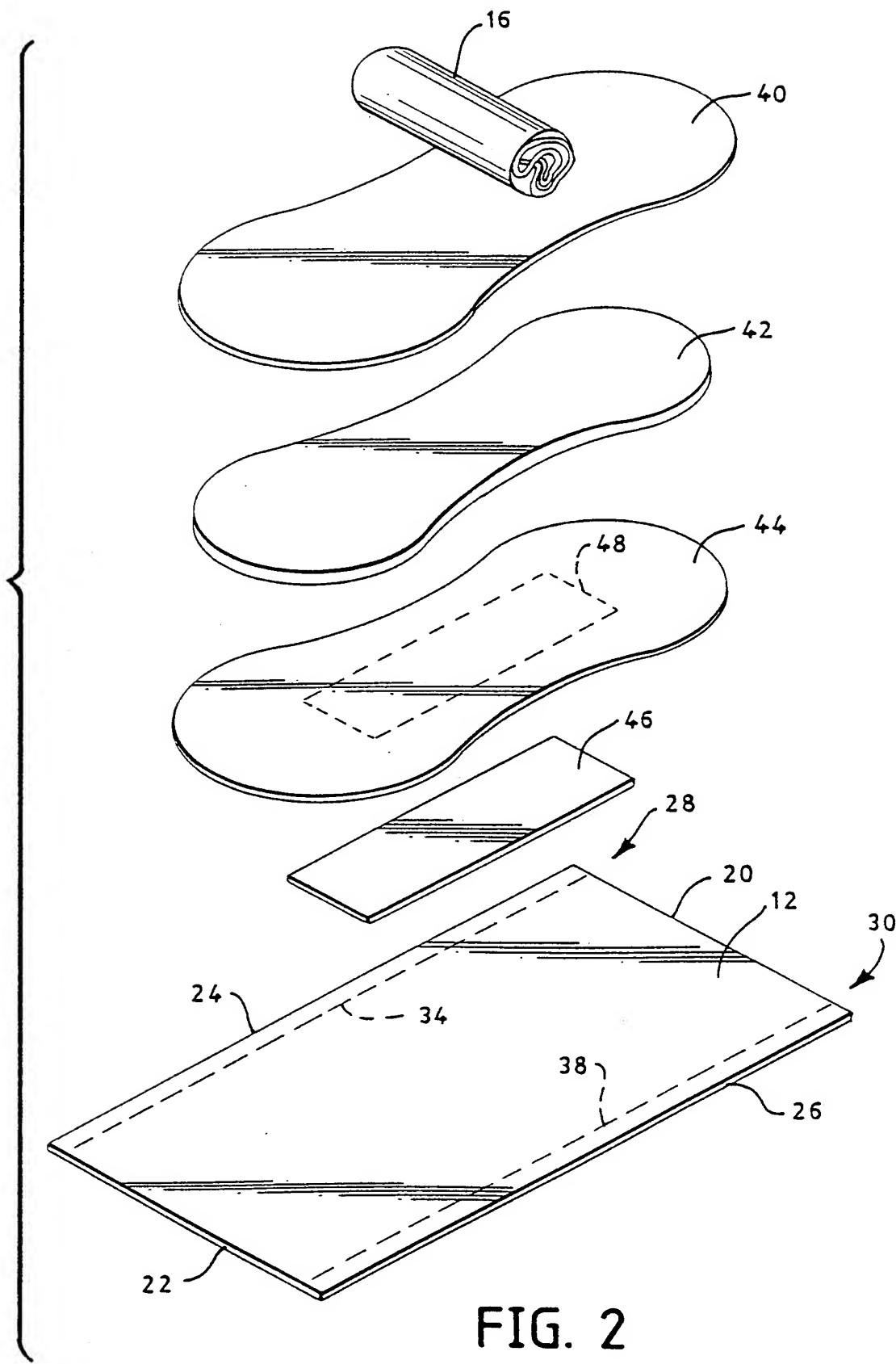


FIG. 2

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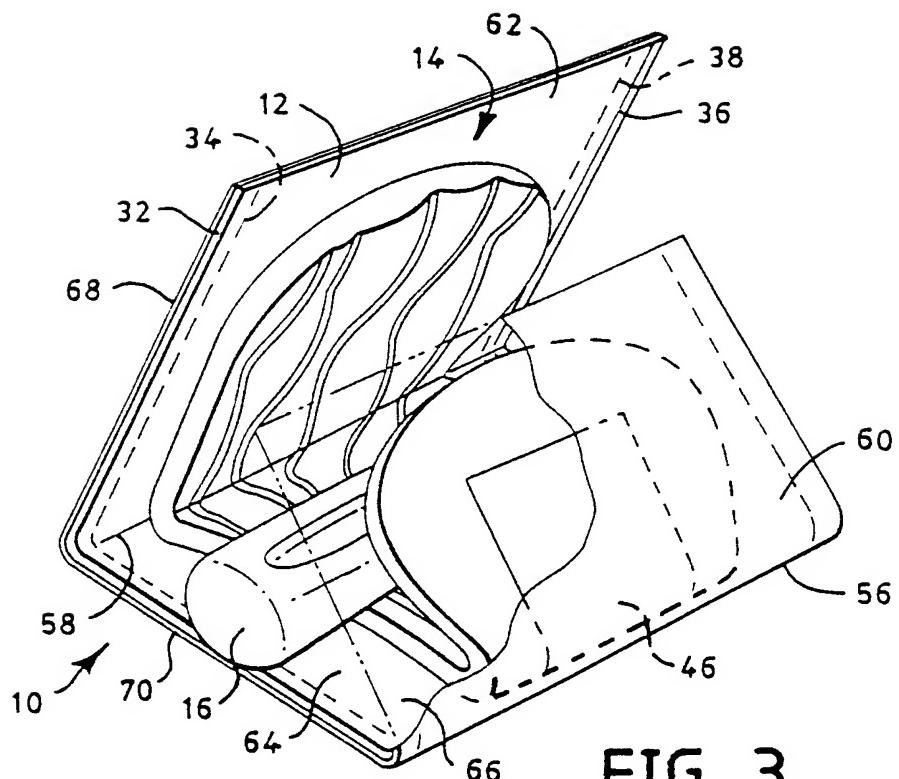


FIG. 3

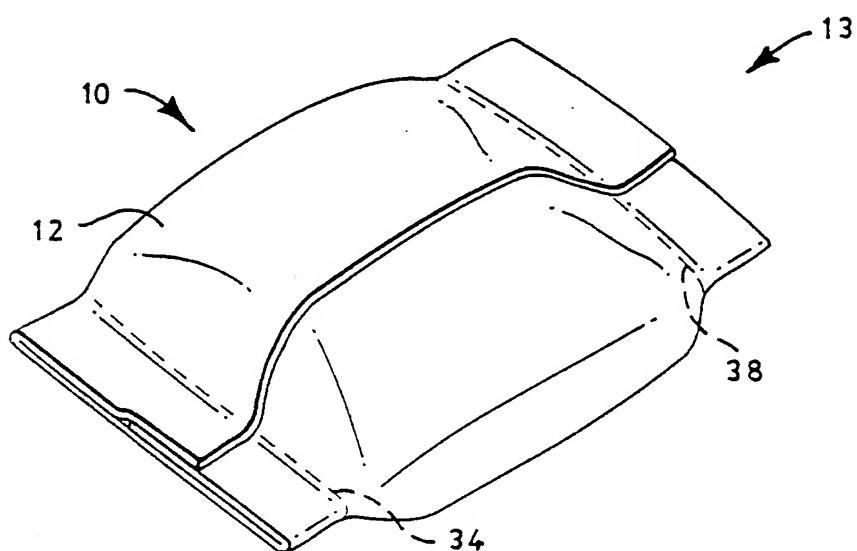


FIG. 4

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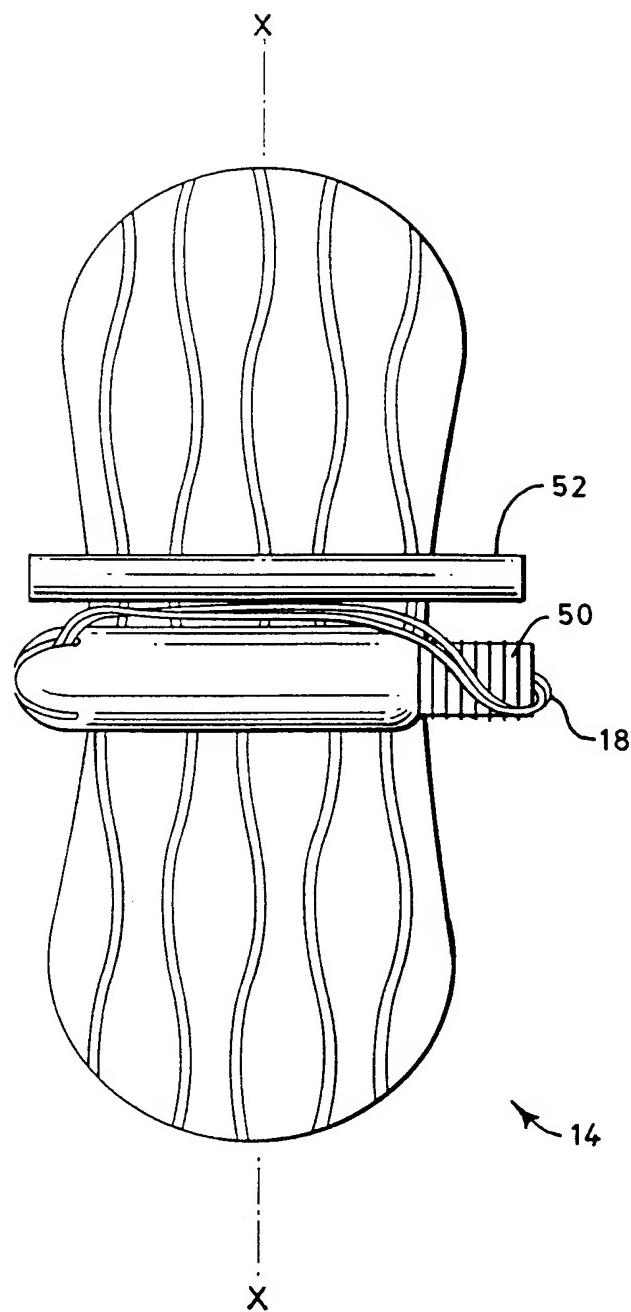


FIG. 5

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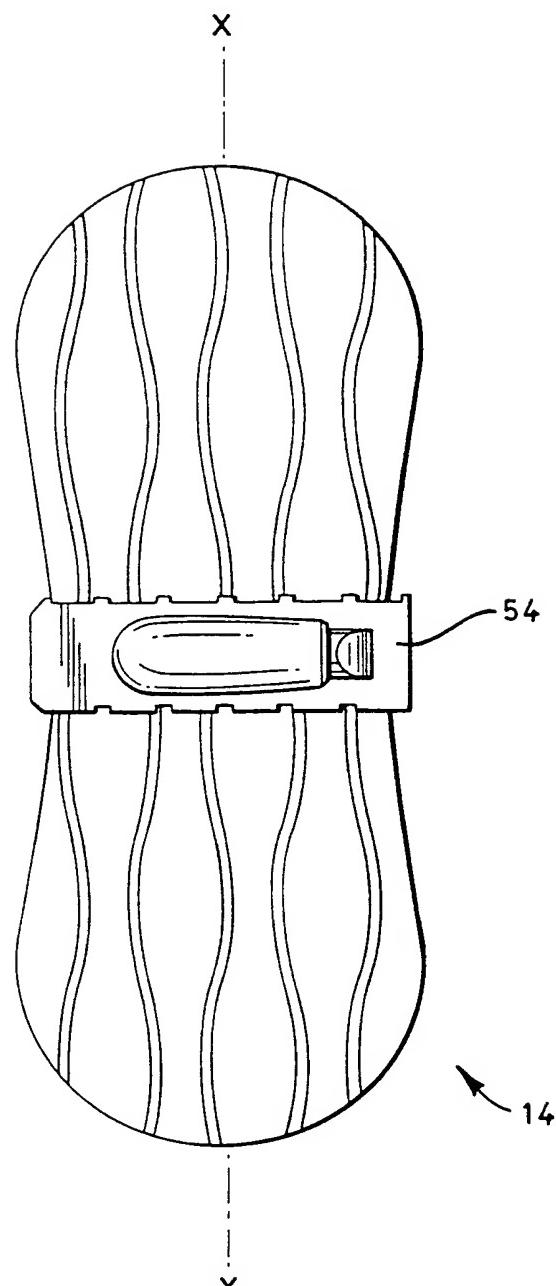


FIG. 6

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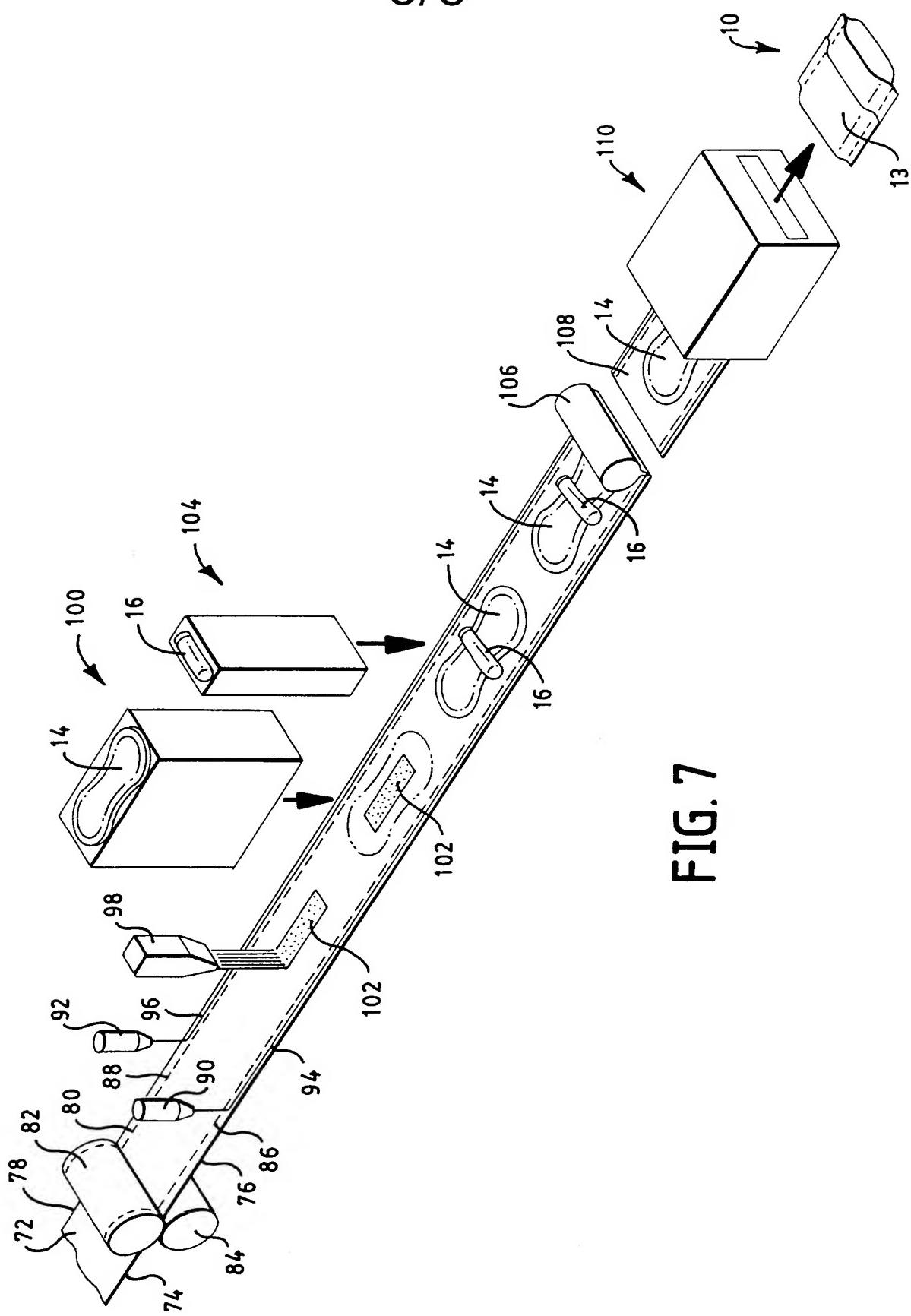


FIG. 7

INTERNATIONAL SEARCH REPORT

In. ational Application No

PCT/US 00/33753

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F13/15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 52485 A (KIMBERLY CLARK CO) 21 October 1999 (1999-10-21) page 4, line 36 –page 9, line 38; figures 1–9 ----	1–7, 10–15, 17,18
A	WO 88 10219 A (MOELNLYCKE AB) 29 December 1988 (1988-12-29) abstract; figures 1–5 -----	1–19

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

14 March 2001

Date of mailing of the international search report

23/03/2001

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/33753

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 9952485	A 21-10-1999	AU 3481099	A	01-11-1999
WO 8810219	A 29-12-1988	SE 464020	B	25-02-1991
		AU 1960388	A	19-01-1989
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